



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/892,954	06/27/2001	Nicole S. Carpenter	BUR920000141US1	3823

29505            7590            09/30/2003  
DELIO & PETERSON, LLC  
121 WHITNEY AVENUE  
NEW HAVEN, CT 06510

[REDACTED] EXAMINER

WINTER, GENTLE E

[REDACTED] ART UNIT

PAPER NUMBER

1746

DATE MAILED: 09/30/2003

7

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)
	09/892,954	CARPENTER ET AL.
	Examiner	Art Unit
	Gentle E. Winter	1746

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 07 August 2003.
- 2a) This action is **FINAL**.                  2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-7 and 10-26 is/are pending in the application.
- 4a) Of the above claim(s) 11-25 is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-7, 9, 10 and 26 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) The proposed drawing correction filed on \_\_\_\_\_ is: a) approved b) disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) The oath or declaration is objected to by the Examiner.

#### Priority under 35 U.S.C. §§ 119 and 120

- 13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) The translation of the foreign language provisional application has been received.
- 15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

#### Attachment(s)

- |  |  |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                    | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ . |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)           | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ . | 6) <input type="checkbox"/> Other: _____ .                                   |

## **DETAILED ACTION**

### ***Election/Restrictions***

1. This application contains claims 11-25 drawn to an invention nonelected with traverse in Paper No. 4. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

### ***Response to Remarks and Amendments***

2. Initially this examiner would like to thank Applicant for a thorough and well-reasoned response. Applicant's arguments have been parsed and addressed below.

With respect to claims 1-3, 6 and 10 applicant argued *inter alia*:

The Lee patent shows the removal of particles on a substrate surface using a tape 14 having an adhesive layer 16. The adhesive layer of the tape is applied to the surface of the substrate 12 and comes in contact with particles 21-24 on the substrate surface. The tape is then removed from the surface and the adhesion layer is able to remove the particles from the surface of the substrate. Referring to the figures of Lee, it is clear that the contaminating particles are only removed at the surface of the adhesive layer. They are not dislodged from the substrate surface and partially or fully encapsulated or suspended within the adhesive layer.

3. While it is possible that the particles are not fully encapsulated, the statement that they are not partially encapsulated does not comport with this examiner's understanding of the word "partially".

4. Applicant continued:

With regard to the Examiner's assertion that energy is applied as in Applicants' invention, this is respectfully submitted technically inaccurate. The energy supplied is to conform the surface of the tape on the surface of the substrate to which the tape is being adhered. There is no energy used which dislodges the particles from the surface of the substrate to be cleaned and which energy moves the particles into the sacrificial coating as in Applicants' invention.

5. Again this examiner disagrees, pressing the tape down is exactly the energy that pushes the contaminants into the adhesive.

Art Unit: 1746

With regard to the Examiner's assertion that the adhesive layer of Lee is a liquid since it is neither solid nor gaseous, it is likewise respectfully submitted that even if it is considered being a liquid, it is not later formed into a strippable film as now set forth in Applicants' claims.

6. Applicant's arguments, in this regard, are persuasive. Applicant is correct that the adhesive tape is not "converted" to a strippable film, since it was one to begin with. As such the pending art anticipation rejection of claims 1-3, 6 and 10 is withdrawn.
7. Applicant further argued with respect to Claims 7, 8, and 9, rejected under 35 USC §103(a) as being unpatentable over Lee and Malotky.

The Examiner acknowledges that Lee fails to explicitly disclose that the sacrificial coating material is a curable polymer formed into a film. Malotky is cited to explicitly disclose the missing element since Malotky discloses a method wherein a tailor-made polymer film is applied to a surface for the purpose of immobilizing contaminating particles. The polymer is disclosed to take up the undesirable material by solution, absorption, adsorption and hold such undesirable materials in solid suspension with subsequent stripping of the polymeric material. The Examiner cites the abstract and col. 2, lines 65 et seq., and col. 4, lines 60 et seq. Lee as discussed above does not disclose nor teach Applicants' invention since it relates to merely removing particles by attachment of the particles to the surface of an adhesive layer on a tape. Malotky does disclose the use of a polymer film system but it is clear that it is not removing particles from a surface but is removing toxic or hazardous chemicals from the surface using a polymer that takes up the undesirable materials by solution, absorption and adsorption.

8. Malotky was not provided for the teaching of picking up particles, Lee was provided for that teaching. Malotky was provided for the element of the polymer.
9. Applicant continued:  
Further, neither Lee nor Malotky teach an integral step of Applicants' invention to apply energy to the coated substrate to dislodge at least some of the particulate matter into the sacrificial coating. Lee as discussed above merely uses the adhesive properties of the tape to attach the particles to the surface of the tape. Malotky expressly teaches that unlike- the prior art methods of removing toxic chemical agents from equipment surfaces, there is no need for the use of mechanical agitation or abrasion. See column 1, lines 67 et seq. Thus, no energy is used.
10. The, conclusion, that because mechanical agitation and abrasion are not required – no energy is used, is troubling. Applicant may be contemplating mechanical agitation or abrasion, but this is not what is claimed. Presumably, Applicant is not suggesting that there is *no* but rather there is not the type of energy contemplated. In Malotky the polymer is sprayed on, thus

Art Unit: 1746

imparting thermal and vibrational energy. Furthermore it is well known in the art to use ultrasonic vibration, or any vibration to assist with maximizing contaminant fluid interaction, in support of this see *inter alia* Dussault et al.

11. With respect to Claims 4 and 5 rejected under 35 USC 103(a) as unpatentable over Lee and U.S. Publication No. 2002/0189635 to Bodet et al. Applicant argued:

The Examiner acknowledges that Lee apparently fails to explicitly disclose the use of sonic energy and vibrational energy and Bodet is cited to disclose a method for cleaning a substrate, including a first step of applying a solution onto the substrate and vibrating the solution/substrate. The ultrasonic energy facilitates release of the deposits from the surface. The Examiner concludes that the artisan would have been motivated to make the instant combination in an attempt to maximize the interfacial contact between contaminants and the cleaner/coating, and with higher viscosity coatings/solutions to ensure better conformal coating. Lee as discussed above does not disclose nor teach Applicants' invention since it merely shows a tape wherein particles on the surface of a substrate adhere to the surface of the tape and are removed when the tape is removed. Bodet et al. shows a process of cleaning a substrate wherein a cleaning solution is supplied to a substrate surface and then a hand held implement applies energy to the cleaning solution to clean the substrate surface. It is clear that there is no strippable-film formed and the cleaning solution maintains its liquid form in the Bodet et al. process. Accordingly, it is respectfully submitted that claims 4 and 5 are properly allowable under 35 USC 103(a)

12. Applicant's arguments are persuasive, the rejection of claims 4 and 5 in view of Lee and U.S. Publication No. 2002/0189635 to Bodet et al. is withdrawn.

13. Applicant's arguments with respect to Dussault are similarly persuasive and the anticipation rejection of claim 1-6 is withdrawn.

#### ***Claim Rejections - 35 USC § 102—Withdrawn/New***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Applicant's arguments, in view of the amendment that the strippable film is formed on the substrate, distinguishes the claims from Dussault, and the anticipation rejection of claim 1-6 is withdrawn.
2. Claims 1-3, 6, and 10 is rejected under 35 U.S.C. 102(b) as being anticipated by 5,690,749 to Lee (Lee).
3. Again, the recitation that the film is formed on the substrate overcomes the anticipatory nature of the rejection, this is not apparently taught by Lee.
4. Claims 1-3, 5, 6, and 10 is rejected under 35 U.S.C. 102(b) as being anticipated by Japanese Patent document 3-261142. The reference reads on claim 1 as follows: A method for removing contaminate particulate matter from a contaminate particle containing substrate surface comprising the steps of: applying a sacrificial coating of a material (water, a liquid) to a substrate surface (reticle mask wafer) containing undesirable particulate matter thereon (fine dust particles), which material is to encapsulate and suspend the undesirable particles therein; applying energy to the coated substrate (heating) to dislodge at least some of the particulate matter from the surface of the substrate into the fluid sacrificial coating such that the particulate matter is partially or fully encapsulated (caught in the ice) and suspended within the sacrificial coating forming a particulate matter containing sacrificial material coating; forming the fluidized particulate matter containing sacrificial material coating into a strippable film (the ice is a strippable film); and removing the particulate matter containing sacrificial material coating from the substrate surface (heater or hot water) providing a substrate surface having less particulate

matter thereon (in this manner the surface is freed from fine dust particles that cannot be removed by washing.

5. With respect to claim 2, a semiconductor wafer is disclosed, i.e. reticle, mask and wafer.

6. With specific respect to claims 3 and 6 the sacrificial coating is disclosed to be water, which is both a liquid and a fluid.

7. As to claim 5, disclosing that the energy is thermal, the same is disclosed, namely as heating either with hot water or a high temperature heater.

8. Claim 10 discloses that the material must be, for instance, a liquid. Water is a liquid. It is noted that claim 26 would be rejected, but for the fact that freezing water is the removal of energy, not the addition of energy.

9. Claims 1-3, 5, 6, 10, and 23 are rejected under 35 U.S.C. 102(b) as being anticipated by United States Patent No. 4,962,776 to Liu et al. (Liu). Liu discloses a cleaning process utilizing the effect of surface tension forces (4) and phase changes between a liquid and gas. The process utilizes a cleaning fluid (52) which is applied to the surface of the article (49) to be cleaned. The fluid being subsequently frozen on the surface, thereby reducing the adhesion force between the surface of the article and undesired particulate matter. The surface of the article (49) is subsequently heated, and the undesired particulate matter is removed through the medium of the cleaning fluid (52).

***Claim Rejections - 35 USC § 103—Withdrawn /New***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 4 and 5 were rejected under 35 U.S.C. 103(a) as being unpatentable over Lee and US PGPub 20020189635 to Bodet et al. (Bodet). The rejection has been overcome as indicated above.

11. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Liu and Bodet. Each and every limitation of claim 4 is disclosed in Liu as set forth above, except that Liu fails to explicitly disclose that the applied energy is ultrasonic energy. Bodet discloses a method of cleaning a substrate, the method including a first step of applying a solution onto the substrate and vibrating the solution/substrate. The ultrasonic energy facilitates the release of the deposits from the surface. The artisan would have been motivated to make the combination of claim 4 in an attempt to maximize the interfacial contact between contaminants and the cleaner/coating, to ensure better conformal coating.

12. Claims 1-3, 6, 7, 10, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee and United States Patent No. 5,120,369 to Malotky.

13. Lee reads on claim 1 and 3 in the following manner. A method for removing contaminant particulate matter (24) from a contaminant particle containing substrate surface (12) comprising the steps of: applying a sacrificial coating of a material (16) to a substrate surface (12) containing undesirable particulate matter thereon (24), which material is to encapsulate and suspend the undesirable particles therein; applying energy i.e. "applying pressure to the tape" (see e.g. column 4, line 25 *et seq.*, especially 40) to the coated substrate to dislodge at least some of the particulate matter (24) from the surface of the substrate into the sacrificial coating (16) such that the particulate matter is partially or fully encapsulated and suspended within the sacrificial coating forming a particulate matter containing sacrificial material coating; and removing the particulate matter containing sacrificial material coating from the substrate surface providing a substrate surface having less particulate matter thereon. What Lee does not disclose is that the material is formed into a strippable film after application, it is noted that while this is not explicitly in the claim language the same is assumed to be the case in light of the arguments and the language of the claim. The system of Lee is considered to be a fluid, and is also believed to be a polymer. Malotky explicitly discloses that the film is applied and then is made strippable after application. The artisan would have been motivated to make the instant combination for the reasons explicitly set forth in Malotky, namely "so that the polymer coating tightly adheres to the surface to be cleaned and decontaminated, so that intimate contact occurs allowing for substantial absorption and/or dissolution of the toxic chemical agent." Column 2, line 20 *et seq.* Application of the lower viscosity liquid would result in better interfacial contact and associated improvements in particle removal.

Art Unit: 1746

14. With respect to claim 2, each and every limitation is as set forth above with respect to claim 1 Lee discloses that the substrate is a wafer.

15. With specific respect to 3, 6, 7, 10 and 26 each and every limitation is as set forth above with respect to claim 1, except that Lee apparently fails to explicitly disclose that the sacrificial coating material is a liquid or curable polymer, and is formed into a strippable film. Malotky explicitly discloses the missing element and provides the motivation for making the combination. Malotky discloses a method wherein a tailor-made polymer film is applied to a surface for the purpose of immobilizing contaminating particles. The polymer is disclosed to take up the undesirable materials by solution, absorption adsorption and hold such undesirable materials in solid suspension with subsequent stripping of the polymeric material. Further, the polymer material a fluid polymer and is disclosed to preferably be one that is capable of being cross linked and applied by conventional spraying, brushing or other coating mechanisms. Thus the missing elements are disclosed. Additionally, the artisan would have been motivated to make the instant combination because the lower viscosity polymer will more effectively encapsulate contaminants, and upon curing (crosslinking) securely bind such contaminants, while simultaneously allowing for the removal of the applied polymer and associated undesired particles. See abstract and see e.g. column 2, line 65 *et seq.* and column 4, line 60 *et seq.* As to claim 9, when the polymer is sprayed onto the inclined surface it will inherently flow and, to the extent contaminants are present will pick them up. The artisan would have been motivated to incline the surface to facilitate easier coating, and easier access to the surface.

Art Unit: 1746

16. With specific respect to claim 26, the spraying action, or other application procedure has the effect of imparting energy, which will assist in the removal of the particulate by dislodging at least some particles from the substrate.

***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gentle E. Winter whose telephone number is (703) 305-3403. The examiner can normally be reached on Monday-Friday 7:00-3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy P. Gulakowski can be reached on (703) 308-4333. The fax phone numbers for

Art Unit: 1746

the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications. The direct fax number for this examiner is (703) 746-7746.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Gentle E. Winter  
Examiner  
Art Unit 1746

September 18, 2003



RANDY GULAKOWSKI  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 1700